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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/800,193	03/11/2004	Hiroshi Kohso	10873.1413US01	8743

23552 7590 05/03/2005

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EXAMINER	
OLSON, JASON C	

ART UNIT	PAPER NUMBER
2651	

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/800,193	KOHSO ET AL.	
	Examiner	Art Unit	
	Jason C Olson	2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 November 1930*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 10-12* is/are rejected.

7)☒ Claim(s) *6-9 and 13-18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *03/11/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

The abstract of the disclosure is objected to because it contains reference numbers. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Stevens et al, (US 6,747,836) hereafter, Stevens.

Regarding claim 1, Stevens teaches a magnetic head for recording / reproducing information on a rotary recording medium (see col. 4, ln. 52-55); a head support mechanism provided swingably on the recording medium while supporting the magnetic head (see figure 5, item 220 and 213); a coarse actuator for swinging the head support mechanism for coarsely positioning the magnetic head on the recording medium (see col. 6, ln. 1-6 and figure 5, item 224); a fine actuator provided in the head support mechanism for precisely positioning the magnetic head on the recording medium (see col. 6, ln. 10-17 and figure 5, item 232); a head position detector for detecting the head position representing the position of the magnetic head

(see col. 8, ln. 30-38; it is interpreted by the examiner that the head position is detected by the head sampling the wedge servo); and a fine movement control system for controlling the fine actuator based on the head position detected by the head position detector (see col. 10, ln. 31-36), the head positioning apparatus, further comprising: a head moving distance estimator (see col. 9, ln. 5-10; it is interpreted by the examiner that the position reconstruction is head moving distance estimator) for estimating a head moving distance representing a distance the magnetic head moves based on VCM Back EMF voltage generated in the coarse actuator (see col. 11, ln. 25-34); and a coarse movement control system for controlling the coarse actuator based on the head moving distance estimated by the head moving distance estimator (see col. 9, l. 16-22 and 25-50).

Regarding claim 2, Stevens teaches the coarse actuator comprises a voice coil motor (see col. 9, ln. 26-29).

Regarding claim 10, Stevens teaches the fine movement control system comprises a fine-movement controller for generating the control signal for controlling the fine actuator based on the head position detected by the head position detector; and the fine movement driving device for generating a driving signal for driving the fine actuator based on the control signal generated by the fine movement controller (see col. 10, ln. 16-35).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stevens and Moon et al. (US 2002/0054451), hereafter Moon.

Regarding claim 3, Stevens teaches all the limitations of claim 1 above, but fails to teach a head absolute speed estimator for estimating a head absolute speed representing the absolute speed of the magnetic head based on the VCM Back EMF voltage; and a coarse movement distance estimator for estimating the head moving distance based on the head absolute speed estimated by the head absolute speed estimator. However, Moon is relied upon to teach a head absolute speed estimator for estimating a head absolute speed representing the absolute speed of the magnetic head based on the VCM Back EMF voltage; and a coarse movement distance estimator for estimating the head moving distance based on the head absolute speed estimated by the head absolute speed estimator (see Abstract and paragraph [0025]; it is interpreted by the examiner that the term speed is the absolute value of the velocity and the estimated head displacement is a coarse movement distance estimation). It would have been obvious to one of ordinary skill in the art at the time the invention was made to improve upon the distance estimator of Stevens by applying the teaching of speed estimating as taught by Moon for the purpose of as stated by Moon in paragraph [0007].

Regarding claim 4, Stevens teaches all the limitations of claim 1 above, but fails to teach the coarse movement moving distance estimator estimates the head moving distance based on the integration of the head absolute speed. However, Moon is relied upon to teach the coarse movement moving distance estimator estimates the head moving distance based on the integration of the head absolute speed (see paragraph [0025]). It would have been obvious to one

of ordinary skill in the art at the time the invention was made to improve upon the distance estimator of Stevens by applying the teaching of speed estimating as taught by Moon for the purpose of as stated above.

Regarding claim 5, Stevens teaches all the limitations of claim 1 above, but fails to teach the coarse movement moving distance estimator estimates the head moving distance based on the integration of the head absolute speed by setting the initial value of the head moving distance to zero. However, Moon is relied upon to teach the coarse movement moving distance estimator estimates the head moving distance based on the integration of the head absolute speed by setting the initial value of the head moving distance to zero (see paragraph [0025]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to improve upon the distance estimator of Stevens by applying the teaching of speed estimating as taught by Moon for the purpose of as stated above.

Claims 11and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stevens and Koso et al. (US 20003/0117742) hereafter, Koso.

Regarding claim 11, Stevens teaches all the limitations of claim 1 above. Stevens fails to teach the fine actuator comprises a piezoelectric element; the fine movement control system supplies a driving signal for driving the piezoelectric element to the piezoelectric element; a level of the driving signal is not more than a threshold value at which the property of the piezoelectric element changes; and the absolute value of the threshold value is larger than the absolute value of the decomposition voltage of lead. However, Koso is relied upon to teach the fine actuator comprises a piezoelectric element; the fine movement control system supplies a driving signal

for driving the piezoelectric element to the piezoelectric element; a level of the driving signal is not more than a threshold value at which the property of the piezoelectric element changes; and the absolute value of the threshold value is larger than the absolute value of the decomposition voltage of lead (see paragraph [0039]; it is interpreted by the examiner that the absolute value of the threshold value is larger than the absolute value of the decomposition voltage of lead). It would have been obvious to one of ordinary skill in the art at the time the invention was made to improve upon the fine actuator of Stevens by applying the teaching of a piezoelectric micro actuator and degradation control as taught by Koso for the purpose of controlling a micro-actuator to within its degradation limits so as not to deteriorate or destroy the micro-actuator.

Regarding claim 12, the combination of Stevens and Koso teach all the limitations of claim 11. The combination is further relied upon to teach the fine movement control system comprises a fine movement controller for generating the control signal for controlling the fine actuator based on the head position detected by the head position detector (see col. 10, ln. 31-36 of Stevens); the fine movement driving device for generating a driving signal based on the control signal generated by the fine movement controller (see col. 6, ln. 10-17 of Stevens); and a driving signal limiter for supplying a signal for limiting the level of the driving signal to be not more than the threshold value to the fine movement driving device based on the control signal from the fine movement controller (see figure 9, items 552 and 560 of Stevens; it is interpreted by the examiner that limiters use threshold values to define the limits).

Allowable Subject Matter

Claims 6-9 and 13-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Regarding claim 6-9, the prior art fails to teach alone or in combination the coarse movement moving distance estimator estimates the head moving distance by defining the coarse movement head moving distance representing the amount that the magnetic head is moved by the coarse actuator, which is obtained by subtracting the fine movement head moving distance estimated by the fine movement head moving distance estimator from the head position detected by the head position detector, as a initial value. Regarding claims 13-16, the prior art fails to teach alone or in combination the absolute value of threshold value is larger than the absolute value of the decomposition voltage of water; and the voltage V (volt) of the driving signal and electric current I (ampere) flowing in the piezoelectric element satisfies the relationship:[(1/V) < 10^-6]; the voltage V (volt) of the driving signal and the film thickness t (meter) of the piezoelectric element satisfies the following relationship:[(V/t) < 2 X 10^7]; the driving signal has a voltage in which the electric resistance of the piezoelectric element is less than 1 MΩ; the threshold value is set under the conditions in which the electric resistance value of the piezoelectric element is 1 MΩ or more even if driving is carried out at the temperature of 85 degrees Celsius and the humidity of 90% for 500 hours continuously. Regarding claim 17, the prior art fails to teach alone or in combination the compensation amount of the piezoelectric element is zero, the fine movement control system outputs a constant value of off set voltage when the voltage applied to the piezoelectric element is zero or not more than a half of the threshold voltage; and in the case where the compensation amount of the piezoelectric

element is not zero, the fine movement control system is control-driven by adding positive/negative voltage in accordance with the value of the compensation amount to the offset voltage. Regarding claim 17, the prior art fails to teach alone or in combination a load estimator for generating the disturbance compensation signal for estimating the disturbance acting on the head positioning apparatus based on the head absolute speed estimated by the head absolute speed estimator and the coarse movement control signal generated by the coarse movement controller.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason C Olson whose telephone number is (571)272-7560. The examiner can normally be reached on Monday thru Thursday 7:30-5:30; alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Hudspeth can be reached on (571)272-7843. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JCO, April 22, 2005

DAVID HUDSPETH
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